GLOBAL ROBOTICS CHALLENGE

RULE BOOK 2026

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CYBER SHIELD CHALLENGE

For More Information:

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1. Competition Overview:

The GRC Cyber Shield Challenge is an educational cyber security competition designed to introduce students to the fundamentals of cyber security, logical thinking, and secure programming practices through theoretical questions and practical challenges.

The competition focuses on:

- **Cyber security awareness**
- **Secure thinking and problem solving**
- **Ethical and responsible use of technology**
- **Basic defensive and analytical security skills (not offensive hacking)**

All challenges are designed for educational purposes only and follow ethical learning standards.

2. Team Composition:

- **Team Members: 2 to 4 Students, guided by a Coach.**
- **Age Categories:**
  - ❖ **Junior Category: Ages 9 – 13**
    - **Challenges :**
      - **MCQ Quiz**
      - **Two Python Problems**
  - ❖ **Senior Category: Ages 14 – 18.**
    - **Challenges :**
      - **MCQ Quiz**
      - **One Python Problem**
      - **One CTF Challenge using Kali Linux**

3. Competition Structure:

Each team will go through the following sections (180 point):

Section 1: Cyber Security MCQ Quiz (Both Categories)

- **30 Multiple Choice Questions**
- **Duration: 45 minutes**
- **Total Marks: 60 marks (2 marks per question)**
- **Topics: Based on the official syllabus in the Appendix**

Evaluation:

- **Correct answer = 2 marks**
- **Wrong answer = 0 marks**
- **No negative marking**

Section 2: Python Programming Challenges

Category A (Junior)

- **2 Python problems**
- **Duration: 45 minutes for each problem**
- **Total Marks: 120 marks (60 marks per problem)**

Category B (Senior)

- **1 Python problem**
- **Duration: 45 minutes**
- **Total Marks: 60 marks**

Evaluation Rubric (for each problem):

- **Correct output: 70%**
- **Logic and approach: 20%**
- **Code readability and structure: 10%**

Section 3: CTF Challenge (Category B Only)

- 1 Integrated CTF challenge
- Duration: 45 minutes
- Total Marks: 60 marks
- Platform: Kali Linux

The CTF challenge may include:

- Linux commands and file analysis
- Basic cryptography (encoding/decoding)
- Hidden data and file inspection
- Simple network or text analysis

Evaluation:

- Each flag has predefined points
- Partial progress may earn partial marks
- Wrong flags give no points

4. Ranking and Awards:

- First Place: Highest total score
- Second Place: Second highest score
- Third Place: Third highest score

Tie-breakers:

- Higher practical score (Python + CTF)
- Higher CTF score (if applicable)
- Faster total completion time

5. General Rules:

- Only one device per team
- ❌ Internet access is not allowed
- ❌ No USB drives or external storage
- ❌ No mobile phones
- ❌ No communication with other teams
- ✅ Only pre-approved tools are allowed
- Any cheating attempt results in direct disqualification

6. Allowed Tools:

Junior Category:

- **Python (IDLE / VS Code / Thonny)**

Senior Category:

- **Python**
- **Kali Linux (pre-installed tools only)**

7. Ethical Policy:

- **This competition is for educational and defensive purposes only.**
- **Any misuse of the learned skills outside the competition is strictly prohibited.**
- **Participants must respect privacy, systems, and rules.**

8. Appendix A – Official Syllabus:

A1. MCQ Topics (Both Categories)

1. **Cyber security basics**
2. **Strong vs weak passwords**
3. **Malware types (virus, worm, trojan, ransomware)**
4. **Phishing and social engineering**
5. **What is encryption**
6. **What is hashing**
7. **Secure websites (HTTP vs HTTPS)**
8. **Basic authentication concepts**
9. **Data privacy and digital footprint**

10. Basic network concepts (IP, server, client, website)

11. Backup and data protection

12. Safe internet usage

Sample Questions:

1. What is the main purpose of a firewall?

A) To store passwords
B) To block unauthorized access
C) To speed up the internet
D) To create viruses

2. Which password is the strongest?

A) 123456
B) password
C) P@ssw0rd!9
D) abc123

3. What is phishing used for?

A) Gaming
B) Stealing personal information
C) Email sending
D) Antivirus

4. What does HTTPS indicate?

A) Faster website
B) Secure communication
C) Free website
D) Gaming website

A2. General Python Topics (Both Categories)

All participants should be familiar with the following Python topics:

- Variables and data types
- If conditions
- Loops
- Functions
- Strings and string processing
- Lists
- Basic file reading and file handling
- Simple logic and problem solving
- Simple encoding and decoding (e.g. Caesar, Base64)
- Basic hashing using libraries (e.g. hashlib)

A3. Sample Python Problems

Junior – Problem Examples

Problem 1: Password Strength Checker

Write a Python program that checks whether a password is:

- **At least 8 characters**
- **Contains uppercase, lowercase, and number**

Problem 2: Secure Message Encoder

Write a Python program that:

- **Takes a message from the user**
- **Encrypts it using a simple Caesar Cipher**
- **Can also decrypt it back**

Senior – Problem Example

Problem: Log File Analyzer

You are given a text file containing login attempts.
Write a Python program that:

- **Counts failed attempts**
- **Finds the most repeated IP**
- **Detects suspicious activity**

A4. CTF (Senior Category)

Example :

Capture The Flag (CTF) – Kali Linux
You are given a Linux folder containing hidden files.
Use Kali Linux tools and commands to locate the file containing the flag: Upload file from here
Flag Format: not standard format but will be given
GRC{example_flag}
hint : not given in real test
ls, cd, cat, grep, strings, file, base64, nmap

9. Technical Requirements (VERY IMPORTANT):

For ALL Teams (Both Categories)

Each laptop MUST have:

1. Operating System

- **Windows 10 or 11**
  OR
- **Linux (kali Linux dual boot or virtual machine are allowed).**

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2. Python

- **Python version: 3.9 or newer**
- **Must be installed and working:**
  - **Command: python --version or python3 --version**
- **Must be able to:**
  - **Run .py files**
  - **Use basic libraries**

Recommended editors:

- **VS Code**
- **Thonny**
- **PyCharm**

3. Required Python Libraries

Must be pre-installed:

- **hashlib**
- **base64**
- **re**

(These are built-in, no internet needed)

Extra for Senior Category :

They MUST have:

Option 1 (Recommended): Kali Linux Virtual Machine

- **VirtualBox installed**
- **Kali Linux VM imported and tested**
- **Must boot and login successfully**

OR

Option 2: Dual boot / Native Kali Linux

- **Kali Linux installed directly on the laptop**

Important Note:

All teams must review and prepare using the materials in the following link:

https://drive.google.com/drive/folders/1QLe-gWup87tUxaaQj42BQwTcBdDueQu?usp=sharing

This link contains:

- **Appendix – Official Syllabus**
- **Full details of the Python challenges**
- **Complete description of what the CTF challenge may include**
- **Technical requirements and setup guides**
- **All required tools and software**

All participants are fully responsible for reviewing this material and preparing their laptops before the competition.

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Good Luck.